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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/666,605	09/20/2000	TOHRU DEN	35.G2647	5370

5514 7590 11/25/2005

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EXAMINER

HU, SHOUXIANG

ART UNIT PAPER NUMBER

2811

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/666,605

Applicant(s)

DEN ET AL.

Examiner

Shouxiang Hu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 8-15, 19-45, 47 and 48 is/are pending in the application.
- 4a) Of the above claim(s) 11, 22, 23 and 25-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-10, 12-15, 19-21, 24, 47 and 48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date #20 & #23 06/04, 10/03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Pending and Active Claims***

According to previous office actions and the latest amendment, claims 1-4, 8-15, 19-45, 47 and 48 are pending in this application; and claims 1-4, 8-10, 12-15, 19-21, 24 47 and 48 remain active in this Office action.

### ***Claim Objections***

Claims 1-4, 8-10, 12-15, 19-21, 24 47 and 48 are objected to because of the following informalities and/or defects:

Claims 1, 12, 47 and 48 each recite the subject matters a structure comprising different-material-filled pore(s) or columnar part(s) being disposed above the surface of the substrate where no electroconductive layer(s) is/are formed or where the other electroconductive layer(s) is/are formed. However, these claims and the original disclosure each fail to clarify what are the functionality (or functionalities) and/or /application(s) of the claimed structure with such different-material-filled pores or columnar parts, and what are the positional relationship(s) between such different-material-filled pores or columnar parts.

Furthermore, claims 1 and 12 recite the subject matters of "another material different from aluminum oxide" filling the pores that are not above the recited conductive layers; but full support are not found in the original disclosure for such subject matters, especially the one about "different from aluminum oxide".

In addition, claims 1, 47 and 48 each recite the subject matters of a plurality of electroconductive layers, but fail to clarify that these electroconductive layers are formed and/or patterned from a same layer in the instant invention.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 8-10, 12-15, 19-21, 24, 47 and 48, as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'090 (JP 11-200090, July 1999; of record) in view of Wegrowe (Wegrowe et al., 6,172,902) and/or Scherer (Scherer et al., US 6,350,623).

JP'090 discloses a structure (see Figs. 6(a), 7(a) and 7(b)), comprising an aluminum oxide layer (13) having a plurality of pores; a conductive layer (11); a material (15) other than aluminum oxide filling the pores; and a conductive path (16) in a portion of the layer containing aluminum oxide that is between the bottom of the pores and the electroconductive layer.

The structure shown in Figs. 6(a), 7(a) and 7(b) of JP'090 does not expressly disclose that the electrically conductive layer (11) can be patterned and/or that the structure can further comprise different-material-filled pore(s) or columnar part(s) being

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disposed above the surface of the substrate where no electroconductive layer(s) is/are formed or where the other electroconductive layer(s) is/are formed.

However, one of ordinary skill in the art would readily recognize that the electrically conductive layer needs to be patterned and arranged between non-conductive regions in order to form individual functional components in an integrated circuit. For example, Wegrowe discloses a structure having pores (Figs. 4 and 5B), comprising: a substrate (20); and a patterned electrically conductive layer (3b); a layer of aluminum oxide (2; see col. 6, lines 8-15) with pores therein; wherein the pores are disposed above the electrically conductive layer and a surface of the substrate where no electrically conductive layer is formed, as the aluminum oxide layer (2) is a pre-prepared porous aluminum oxide membrane layer (see col. 4, lines 14-20) full with densely formed pores (see 3, lines 38-40) and the conductive layer only underlies a portion of the porous membrane layer with some of the pores (1) therein filled with magnetic material(s). And, the one of ordinary skill would also readily recognize that different pores can be filled with different materials in order to have different regions with different functionalities integrated in a same device structure. For example, Scherer (Figs. 7 and 8) teaches to form an inductor having a conductive material filling the pores above conductive layers (46 or 48) and an insulating material (50) filling the pores where no electrically conductive layer is formed. Furthermore, it is noted that it is art known that the inductor is commonly used in the art for signal filtering and for signal generating, and that metal such as Cu or Al and insulator such as SiN or SiO<sub>2</sub> are

respectively the common conductive and insulating materials used to form the inductor in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the structure of JP'090 with the electrically conductive layer being patterned so as to form different conductive layers in different element areas, including one for an memory cell (with magnetic material filling the pores above patterned the conductive layer(s) in the cell) and another for an inductor (with art-known Cu and SiO<sub>2</sub> respectively filling the electrically connected and non-connected pores), per the teachings of Wegrowe and/or Scherer, so that integrated individual functional components in an integrated device/circuit would be obtained.

Regarding claims 2 and 13, at least more than one of the recited metal elements are disclosed in paragraph 0029 in JP'090.

Regarding claims 4 and 15, it is noted that one of ordinary skill in the art would readily recognize that the substrate can also be made of a conductive layer underlying an insulating layer (as evidenced in the prior art such as 6,194,255, see col. 3, lines 12-15).

### ***Response to Arguments***

Applicant's arguments with respect to the above rejected claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH  
November 21, 2005



**SHOUXIANG HU**  
**PRIMARY EXAMINER**